joined pipe length having a plurality of continuous juxtapositioned reinforcement fibers formed with a solid material composition selected from the group consisting of ceramics, metals, carbon, glass compositions and organic polymers thermally bonded to the outer wall surface of said joined pipe lengths at a predetermined spatial angle with respect thereto for maximum effectiveness in withstanding applied internal stress when the reinforced pipe members are subsequently applied in an unbonded condition while maintaining the already formed pipe lengths in their hollow condition and the subsequent thermal bonding of the applied fibers only adhering the applied fibers to the outer wall surface of the underlying pipe lengths without utilizing further adherence agents and while not further melting said underlying pipe length to avoid introducing thermally induced residual stress thereto.

REMARKS

All remaining claims 1-3 and 5-9 in the subject CPA application have been still further amended in a manner deemed to patentably distinguish both in structure and physical properties from the single Gibson et al (H1261) reference being relied upon. Specifically, the now amended claims expressly require that an "already formed" and hollow thermoplastic pipe member be reinforced with designated continuous fiber that have been wrapped about the outer surface of said hollow pipe member and subsequently adhered thereto. It is respectfully submitted that the now claimed final product and its physical characteristics differ from that either disclosed or obviously suggested in the sole Gibson et al reference being relied upon for reasons given below.

First and foremost, the Examiner is respectfully submitted to have misconstrued Gibson et al as disclosing or obviously suggesting the now claimed final product. Said reference neither discloses or suggests any reinforcement of an already existing pipe member with continuous fiber wrapped about the outer pipe surface as presently claimed. The final product in said reference consists solely of a hollow member formed entirely with reinforcement fiber bonded together with a thermoplastic matrix material. More particularly, said final product in Gibson et al is entirely devoid of the underlying "pipe

length" expressly recited in all of the present claims. Gibson et al's final product consist only of multi-wraps formed entirely on a heated mandrel with the bottom wrap having only melted "thermoplastic matrix" material while successive wraps further containing the reinforcement fiber are thermally bonded thereto in the same manner. When formed, all layers in the Gibson et al product are further said to require both internal and external heating to avoid "thermally induced stress" as already recognized by the Examiner (see column 3, lines 48-53 in said reference). The degree of such heating employed in Gibson et al is still further said to convert all of the applied "thermoplastic matrix material" to a thixotropic molten state (see column 2, lines 15-18 in said reference.

The now claimed final product has a structurally dissimilar construction in several important respects. The existing structure of an "already formed" hollow pipe member can be retained together with its physical properties in forming the now claimed final product. Not requiring the existing hollow pipe member itself to be heated to a molten condition understandably retains the original physical properties as well as reduces thermally induced stress in the final product. All wraps in the now claimed final product include reinforcement fiber as distinct from the bottom wrap being employed in Gibson et al's final product. Sustained internal and external heating of all wraps after being deposited is also required in the reference to retain the already applied thermoplastic matrix material in a molten condition. Such method of preparation lowers mechanical strength in the final product from added thermal stress and thermal degradation as pointed out to the Examiner in the preceding amendment. A far more simple and limited heating of the reinforcement fibers in the now claimed composite article has now been discovered to sufficiently adhere the applied fibers to the outer wall surface of an existing hollow pipe length as recited in all present claims. The now claimed final product only modifies the original structure of the hollow pipe member by limited thermal bonding of the reinforcement fiber to its outer wall surface. Thus, a limited outer surface heating of the underlying hollow pipe length(s) in the now claimed final product advantageously

preserves the original pipe configuration together with its physical properties.

It is still further respectfully submitted that said reference does not obviously suggest the multiple fiber reinforced thermoplastic pipe members recited in the now amended claims 7-9. All requirement for a heated mandrel in said reference to support a dissimilar multi-wrap construction while being formed thereon is entirely eliminated in the now claimed distinctive manner of existing pipe reinforcement. Moreover, said reference relates only to fabrication of a single reinforced thermoplastic member as distinct from continuous reinforcement of multiple pipe lengths after being joined together. That only such single member construction is either disclosed or obviously suggested in said reference is abundantly evident from a need for removal of said continuously heated mandrel after forming the single member thereon. It understandably further follows therefrom that said reference procedure is necessarily limited to a batch type operation as distinct from a continuous mode of operation thereby experiencing higher labor costs accompanied by lower operating efficiency. A still further requirement in Gibson et al to maintain sustained heating of all wraps with said heated mandrel is likewise eliminated in the now claimed improvement. As presently claimed, all continuous fiber reinforcement is applied in an "unbonded condition" to the outer wall surface of the continuously moving pipe members and thereafter only subjected to limited surface heating with remote heating means (see element 50 in FIG. 1 of the applicant's drawings).

It can only be reasonably concluded from the above specified structural differences existing in the claimed final article of all rejected claims 1-3 and 5-9 that the rejection of all said claims under both 35USC102 and 35USC103 should not further be maintained. All rejected claims still further require that "continuous juxtapositioned reinforcement fibers" be utilized in the final product. As distinct therefrom, Gibson et al discloses suitable reinforcement fiber to be either continuous such as glass yarn (Example 9) or discontinuous (commingled) glass fibers (Examples 1-8). Such decided

preference in said reference for the discontinuous variety of reinforcement fibers certainly further leads away from the now claimed final product. Recognizing the critical importance for said component with respect to providing added mechanical strength in the final article, a skilled artisan reading said reference is very likely to improperly select the commingled or discontinuous variety of reinforcement fiber over that required in the now claimed product. It could only be from unpermitted hindsight of the present applicant's own discovery that a skilled artisan would properly select "continuous juxtapositioned reinforcement fiber" as required in the now claimed product. The reference also fails to obviously suggest the now improved product in certain other critical respects. Gibson et al requires the final multi-layer composite article to be formed with sustained internal heating being provided from a mandrel support (see column 7, lines 31-32 in said reference). Such internal mandrel heating is said to be subsequently discontinued allowing the final article to cool for its removal from the mandrel support (see column 8, lines 56-58 in said reference. The skilled artisan would not obviously conclude from this description that an already existing hollow thermoplastic pipe member can be suitably fiber reinforced in a far less complex manner that does not require continuous heating of the entire composite article from the eliminated mandrel support. More localized and limited heating after the reinforcement fiber has been applied in the now claimed composite article preserves the pipe member in its original condition. Removal of Gibson et al's requirement for a mandrel support now further enable a continuous processing of multiple existing thermoplastic pipe members having the same improved fiber reinforcement. That the final article in Gibson et al has a base layer of thermoplastic material thermally bonded to successive overlays of reinforcement fiber is of no relevant consequence. Said reference article is formed entirely de novo on the heated mandrel having resultant physical properties attributable at least in part to such method of preparation. As distinct therefrom, the now claimed fiber reinforced thermoplastic pipe member(s) simply modifies an existing thermoplastic pipe length while still in its original hollow condition by

thermally bonding continuous juxtapositioned reinforcement fiber to the outer wall surface. Accordingly, the underlying pipe length in the now claimed construction can retain its original physical properties since only the outer wall surface undergoes subsequent thermal processing. Such benefit of retaining original physical properties in the now claimed composite article should certainly be deemed nonobvious from a consideration of this reference. It also follows that limiting the outer wall surface of the pipe length to thermal processing produces a superior final product experiencing less thermal degradation. Sustained heating of the entire final product in Gibson et al exposes said final product to a far greater degree of thermal degradation as would be clearly further evident to the skilled artisan.

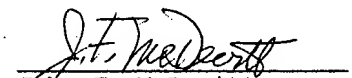
The remaining rejection of all presently amended claims 1-3 and 5-9 under 35USC112 can also not be agreed with. In said regard, the Examiner is respectfully deemed to have overlooked subject matter either specifically recited or otherwise inherently disclosed in the originally filed application. With respect to the claim recital "the subsequent thermal bonding of applied fibers only adhering the applied fibers to the outer wall surface of the underlying pipe length without utilizing further adherence agents", the Examiner's attention is first directed to the included drawings. Both Figures depict a hollow thermoplastic pipe member (14) being continuously moved in a linear direction for the purpose of having multiple wraps of applied juxtapositioned reinforcement fiber (22, 34 and 44 in Figure 1) becoming thermally bonded to the outer pipe surface as specifically recited on page 16, lines 23-30 in the applicant's specification. A further absence of reference to utilizing adherence agents, such as adhesives and the like, in either said drawings or elsewhere in the applicant's specification is deemed to implicitly disclose such absence. Similarly, the claim recital "while not further melting said underlying pipe length to avoid thermally induced residual stress therein" is deemed inherently disclosed from inspection of the applicant's drawings and specification. Without further melting of the underlying thermoplastic pipe length is inherently disclosed since the hollow pipe member is being

continuously processed without experiencing physical distortion of the member itself. It is respectfully submitted that a skilled artisan would find all of the presently questioned recitals already implicit in the originally filed application and a declaration under 37 CFR 1.132 to said effect accompanies this amendment.

In summary, it can only be reasonably concluded from the above noted structural differences and accompanying affidavit that a patentable distinction exists for the now claimed final product. It can only be unpermitted hindsight in view of the present applicant's own teachings that can be regarded to obviously suggest the now claimed product from a reference employing a dissimilar fabrication method employing dissimilar means to form a structurally dissimilar final article. As evidenced in the accompanying declaration, one skilled in the fiber reinforcement of thermoplastic pipe constructions would not obviously consider from reading Gibson et al that having the reinforcement simply bonded to the outer surface of the already prefabricated solid pipe member in a far more simplified manner could produce an unexpectedly superior final product. It is respectfully urged, therefore, that all now amended claims 1-3 and 5-9 be allowed as structurally distinguishing over the article construction in Gibson et al.

An appendix of the product claim amendments is also provided on separate pages accompanying this amendment together with a completed PTO/SB/22 form and required fee requesting a one (1) month extension.

Respectfully submitted,



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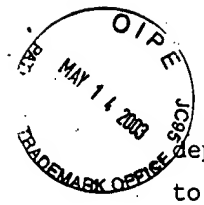

CERTIFICATE OF MAILING

I HEREBY CERTIFY that this Amendment A is being deposited with the Postal Service in an envelope addressed to the COMMISSIONER OF PATENTS AND TRADEMARKS on this 3rd day of May 2003.

John F. McDevitt

APPENDIX

1. A fiber reinforced pipe [length] member comprising [a] an already formed solid thermoplastic [organic member] pipe length having an outer wall enclosing an inner hollow cavity which includes a plurality of continuous juxtapositioned reinforcement fibers formed with a solid material composition selected from the group consisting of ceramics, metals, carbon, glass compositions and organic polymer thermally bonded to the outer wall surface at a predetermined spatial angle with respect thereto for maximum effectiveness in withstanding the applied internal stress when the reinforced pipe [length] member is subsequently put into service, the continuous fiber having been continuously applied in an unbonded condition while maintaining said already formed pipe [length] member in its hollow condition and the subsequent thermal bonding of the applied fibers only adhering the applied fibers to the outer wall surface of the underlying pipe [length] member without utilizing further adherence agents and while not further melting said underlying pipe length to avoid introducing thermally induced residual stress therein.

7. A plurality of identical fiber reinforced pipe [lengths] members joined together prior to reinforcement at the ends and each comprising a solid thermoplastic [organic polymer member] pipe length having an outer wall enclosing an inner hollow cavity, said joined pipe length having a plurality of continuous juxtapositioned reinforcement fibers formed with a solid material composition selected from the group consisting of ceramics, metals, carbon, glass compositions and organic polymers thermally bonded to the outer wall surface of said joined pipe lengths at a predetermined spatial angle with respect thereto for maximum effectiveness in withstanding applied internal stress when the reinforced pipe [lengths] members are subsequently put into service, the continuous fibers having been continuously applied in an unbonded

condition while maintaining the already formed [joined] pipe lengths in their hollow condition and the subsequent thermal bonding of the applied fibers only adhering the applied fibers to the outer wall surface of the underlying pipe lengths without utilizing further adherence agents and while not further melting said underlying pipe length to avoid introducing thermally induced residual stress thereto.